DOCUMENT RESUME

ED 294 318 EA 020 006

AUTHOR Nagakura, Yasuhiko; Moronuki, Mikio
TITLE How the Architectural Research Is Used in Educational Facilities and Design in Japan. Phase II.
PUB DATE Nov 86
NOTE 33p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Architectural Research; *Building Design; Classroom Furniture; Construction Costs; *Educational Environment; *Educational Facilities Design; *Educational Facilities Planning; Elementary Secondary Education; Foreign Countries; Individualized Instruction; Instructional Materials; Modular Building Design; Open Education; Open Plan Schools; *School Buildings; School Construction; Shared Facilities; Space Utilization; Systems Building
IDENTIFIERS *Japan

ABSTRACT

When designing schools, one should assign space for athletic fields, arrange halls so that traffic will not disturb classrooms, separate grade levels, provide playgrounds exclusively for younger children, and provide lighting and ventilation. Unit plans should be designed so that all educational and domestic activities can be executed in the vicinity of the classroom, the classroom can adjust to changing studies, and the classroom provides uniform environmental conditions. Housing development ideas include the neighborhood unit theory; joint use of schools and their facilities; the open school concept; and sharing a school common area. Modules and systems building are economic techniques for school construction. Multipurpose open spaces and conceiving of the school environment as a means for learning are essential elements in school architecture. V-type organization facilitates adjustment to different subjects, as well as individualized and autonomous learning. The construction of open schools is no more expensive than that of conventional schools. The issues involved in the planning process include constraints, educational demands, noninstructional demands, and community demands. Included are 36 illustrations (13 of which are floor plans), 1 table, and 10 photographs. (RG)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED294318

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Yasuhiko Nagakura

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"

How the architectural research is used in educational facilities and design in Japan

Phase II The Development Group establishes its research studies on the specific planning and applications of schools buildings for the past 30 years, we have 68 working examples.

DR. YASUHIKO NAGAKURA & MIKIO MORONUKI
Tokyo Metroporitan Univ. Tokyo, Japan.

Outline

The Development Group is a research team organized by Professor Yasuhiko Nagakura (Tokyo Metoropolitan University) in order to study the planning of school building. The other members of this group are Hiroshi Hara, Hiroshi Nakamura, Jun Ueno, Satoru Nagasawa, Mikio Moronuki and those students who have studied architectural planning at the graduate school of Tokyo Metropolitan University (56 students have graduated up to date).

We have been basing our research on the method that is to learn the demand for architecture from detailed observation of teachers and pupils. So for, we have published approximately 300 articles related to itematized designs in practice to raise the level of the Japanese school buildings by re-observing and re-investigating the completed buildings.

Taking the 68 buildings (elementary and secondary schools) we planned for as working examples, this report explains the report explains the purposes and description of the Japanese school buildung from eight basic themes. we also mention the application of our research and the 30 years history of the Japanese school building.

EA020006

BEST COPY AVAILABLE

I. BREAKING AWAY FROM STANDARDIZATION

A School Block Plan

School building construction in Japan during the first half of the 20th century exclusively utilized the single-loaded corridor arrangement or so-called "finger plan". After the war, with a firmer overall understanding of European and American school building construction, it became common practice throughout the country to situate school buildings with such an arrangement on the north side of the grounds. Such an arrangement has its advantages in terms of Japanese climatic conditions. However, its indiscriminate, standardized application presents significant problems. It is critical when designing schools to formulate spatial arrangements which take the unique characteristics of the site into account. This is not just a contention advocated by our group; it has now become a practical objective as well. Today, in any design configuration for the construction of a school, Japanese designers must take into consideration a number of essential criteria as part of their objective. These have been arranged into 76 items of which the following are a few examples:

(1) Formulate a plan that is compatible with local climatic and topographical conditions and unique regional characteristics (heat, cold, ventilation, precipitation, etc.)

(2) Judiciously allocate area for school grounds and athletic fields; in particular, enrich the environment in the immediate vicinity of the school buildings.

(3) Isolate outdoor activities (athletic field, etc.) from the school buildings so as not to disturb the classrooms.

(4) Arrange lines of movement between entrances and exits to prevent traffic patterns which haphazardly traverse athletic fields or spaces directly in front of classrooms.

(5) Arrange classrooms and ancillary spaces to be used by different grade levels to provide separate environments suitable for respective grade levels.

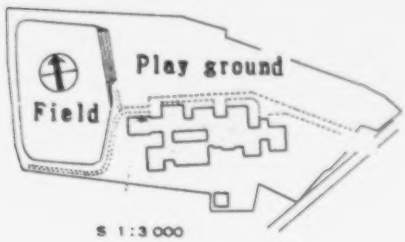
(6) In primary schools, formulate spatial arrangements that provide exclusive playground space for children in lower grades, isolated from spaces used by upper grade students.

(7) Design a spatial arrangement for schools where a separate indoor footwear policy is implemented that will not call for unnecessary detours from one part of the school to ancther and that will prevent congestion during footwear change.

(8) Design a spatial arrangement that under the same conditions will provide ample daylight illumination and ventilation to all rooms, especially, regular classrooms.

(9) Consider a spatial arrangement that minimizes area which does not perform a direct educational function (30% on the average).

Here, we would like to cite KOMONNA Elementary School in Toride and Azuma Upper Secondary School in Gunma Prefecture as two examples in which a consideration of these principles of spatial design was taken into full account. Part of a planning program in the early sixties, both schools succeeded under the framework of the Ministry of Education's suplemental standard area for public schools in eliciting new, non-standardized building configurations.



S 1:3000

KOMONNA Elementary School (Ibaragi)

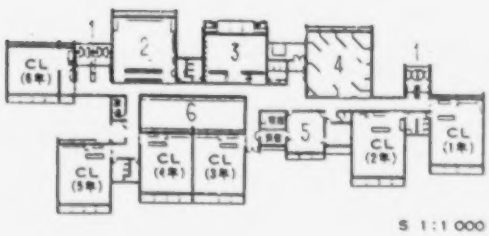
Design : Y. Nagakura & Development Group

Site Area : 7500 m²

Total Floor Area : 1038m²

No of Class : 8

Work Finished : 1965



S 1:1000

① entrance
② craft
③ libraly
④ music
⑤ staff
⑥ court

AGATUMA Upper Secondary School (Gunma)

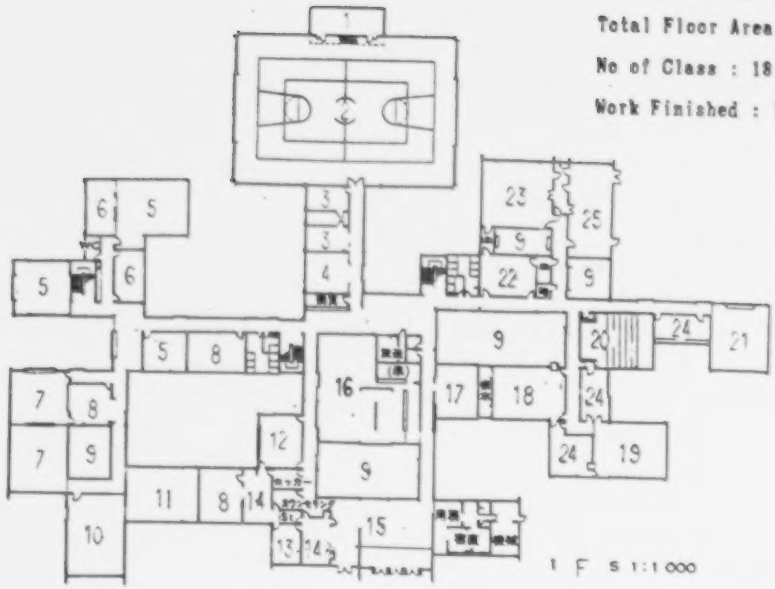
Design : Y. Nagakura & Development Group

Site Area : 28500m²

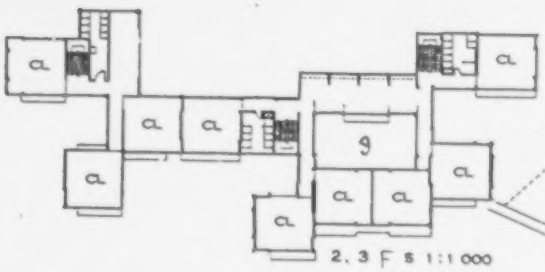
Total Floor Area : 8100m²

No of Class : 18

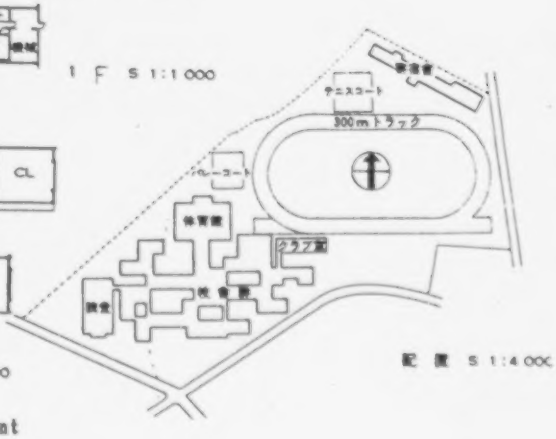
Work Finished : 1964



1 F S 1:1000



2, 3 F S 1:1000



配置 S 1:4000

① storage
② gymnasium
③ change
④ discussion room
⑤ commercial
⑥ typewriting
⑦ needle craft
⑧ staff team room
⑨ court
⑩ cooking
⑪ home economics
⑫ meeting
⑬ president
⑭ office
⑮ entrance
⑯ libraly
⑰ nurse
⑱ biology
⑲ chemical
⑳ physical
㉑ art
㉒ audio-visual
㉓ music
㉔ prep room
㉕ english

The Possibility of a Unit Plan

Built in 1955, the various branch schools of the Yagumo Elementary School (now the Miyamae Elementary School) had a major impact on school building construction in Japan in subsequent years. In contrast to virtually all public school buildings of the time, which were constructed of wood, this was Japan's first serious experimental application of steel frame construction in a public school and it incorporates the results of a number of contemporary studies of steel frame construction methods. The school also played a role in the development of systems building in more recent years. It was here that the search for the possibility of introducing new unit plans for school buildings in lieu of the standardized single-loaded corridor arrangement really began.

The following are a list of design principles for unit plans which we believe to be important based upon the conclusions we have drawn from studies regarding methods of classroom use. We have employed these principles in the design of a number of new unit-plan schools.

(1) All educational activities should be able to be carried out and concluded in classroom contiguous space. This calls in particular for the diversification of lower grade level classrooms.

(2) In elementary schools, all domestic functions and facilities should be housed as much as possible in the immediate vicinity of the classroom.

(3) Outdoor space for leisure and study activities should be designed around and organically linked to the classroom.

(4) The shape and size of the classroom should be adaptable to changing forms of study.

(5) The shape and size of classroom units at each grade level at all schools should be able to handle different methods and forms of study of varying content.

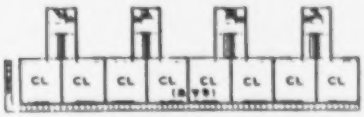
(6) Layouts should arrange classrooms of the same grade level in groups to form zones for different grade levels.

(7) One should consider floor plans and sectional configurations which provide uniform environmental conditions at any seating location within the room, particularly in regard to the question of lighting.

(8) The floor area occupied by corridors and stairs should be minimized and plans should be made to transform such space into more classroom space, contiguous classroom space or locker rooms.

Various plans have been considered for developing these principles even while continuing to strictly observe limitations on contiguous classroom area. Following the Yagumo Elementary School Branch School - a unit plan in which we took special pains to incorporate the sixth principle, namely, accommodating different class levels - we have attempted in each of the schools that we have designed since to explore and put into practise all of the principles cited above.

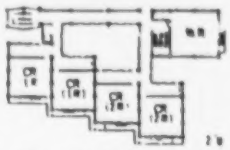
2 Class Room Unit



Miyamae Primary School (Tokyo)

Daisan Kameido Secondary School (Tokyo)

Variety of 2 Class Room Unit

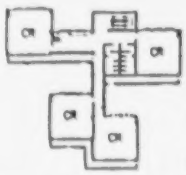


Daiichi Nippori Primary School (Tokyo)

3 Class Room Unit

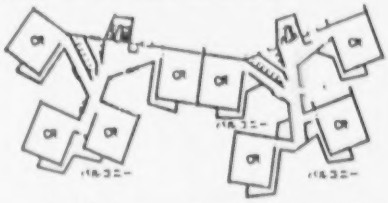
Tomioka Higashi High School (Gunma)

4 Class Room Unit



Toride Daiichi Secondary School (Ibaragi)

Variety of 2 Class Room Unit



Ino Primary School (Ibaragi)

II. School Architectural Plans for Housing Developments

The construction of public housing complexes began in the mid fifties in Japan. Since the residents of such complexes tend to be younger couples with a high ratio of children, the construction of schools for such housing developments has presented vexing problems for local municipalities. Since the mid-sixties, our group has been vigorously studying methods of predicting child and student populations in housing complexes in order to assist in the planning of educational facilities. One example is illustrated in the graph. Here, we asked ourselves how child and student populations change from year to year in a housing complex after it has been occupied in regard to criteria such as the type of family, age of householders, architectural style and scale of the residence, type of housing and its relative location, etc. From the results of our research, we are now able to broadly estimate changes in child and student populations from the number of households classified according to the type of residence.

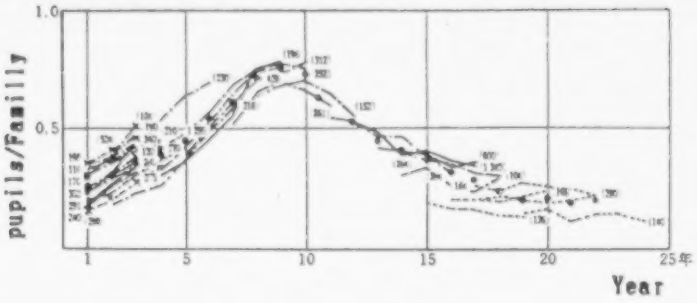
Neighborhood unit theory is a method used in the planning of housing developments which, focusing on the primary school, regards the area included in a school district as that area made up by the residential district. The method is finding increasing applications even in Japan. A typical example of a plan in which neighborhood unit theory was employed is the large housing complex in the Senri Hills area begun in 1955, and more recent developments include the Kozoji housing complex and Tsukuba Science City. We can see from our continued participation in educational facility network planning at these three large housing developments that planning for district facilities such as schools is not a question that should be passively decided by the residential plan. Instead, it has become necessary to regard the scale and displacement of educational facilities as being part and parcel of the residential plan, while at some later date to seek planning methods which will utilize the results of predictions for child and student populations.

The Grant Heights Project, begun in 1970, is somewhat different from the housing developments mentioned above as it ushers in the high-rise, high-density housing complex. The studies we

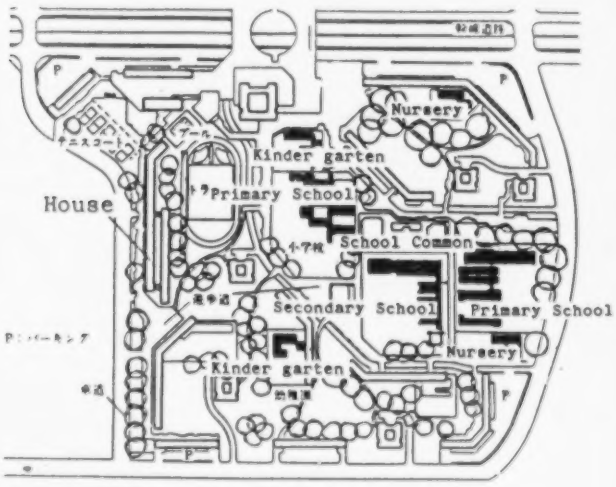
conducted for this plan have been crucially important to us. We found that plans designed on neighborhood unit theory do not produce favorable results in high-rise, high-density districts; that is to say, a plan which calls for the placement of a school in the center of a housing development community as a school district is not something which can give rise to a good housing development. In a high density development, schools wind up being in close proximity to each other and residences also tend to be close to schools. This is also true of area facilities. In other words, quantitative changes give rise to new qualitative problems. So where should one look for a planning method which does not depend upon neighborhood unit theory?

In contrast to neighborhood unit theory, we propose, hypothetically, the concept of structuring space in order to provide a sense of unity and sequence, of creating order through the orientation of this duality, and positioning the school within this orientation. In other words, we propose a concept which does not call for a closed neighborhood unit, but, rather, one which (1) working from small to large, can perceive the housing complex as space arranged in stages (a feeling of unity); (2) has a spatial relativity that can open up mutual spaces and provide a sense of sequence; and (3) provides an orientation within this sequence that moves outward from the center towards the extremes. Whether this kind of flexible planning theory is appropriate for not just high-rise, high-density housing developments, but for housing developments as a whole, has become a subject of debate. From the results of this kind of research, it is clear that school planning is something that requires much greater development. Other ideas that have been considered include combining or jointly using schools and/or their facilities. The concept of the open school is also expected to have an impact in this regard. All of these issues are expected to become issues of major concern. At the time of the Grant Heights School Project, we initiated a proposal to build a school common area to be jointly used by two primary schools or a primary school and a lower secondary school, as well as a school open area to be jointly used by the community. During the ten year period in which the construction implemented in this project was carried out in stages, we participated in the design of a primary school based on this proposal. The appended figure shows the layout for the school we designed.

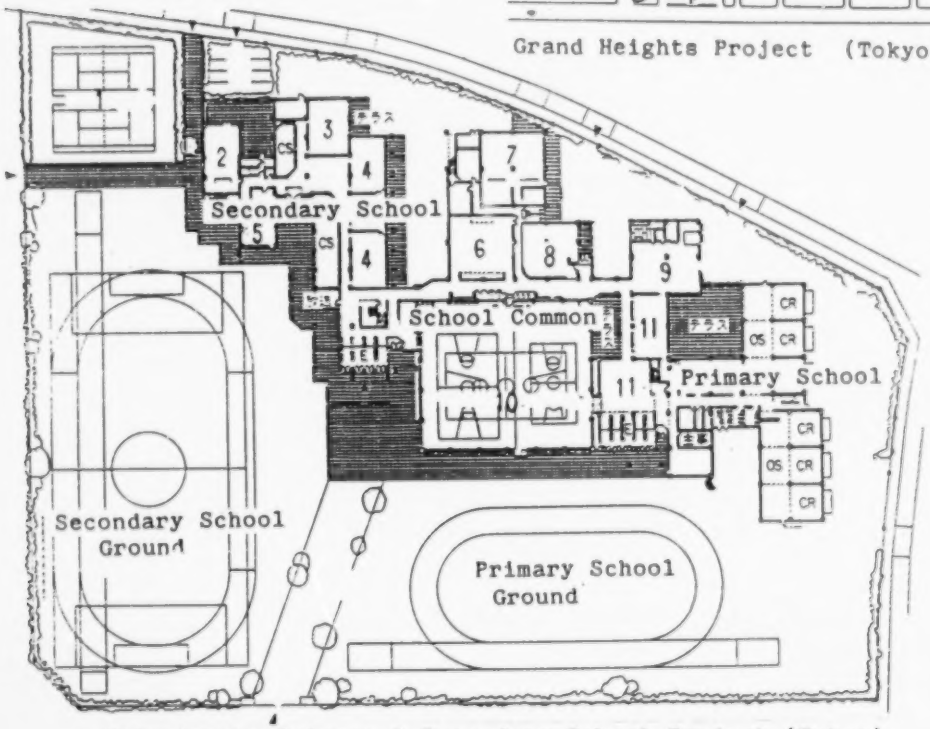
The Number of Elementary School Pupils per Familly in Danchi



① tennis court
② art
③ special class
④ science
⑤ nurse
⑥ audio-visual
⑦ metal work
⑧ libraly
⑨ kitchen
⑩ gymnasium
⑪ hall



Grand Heights Project (Tokyo)



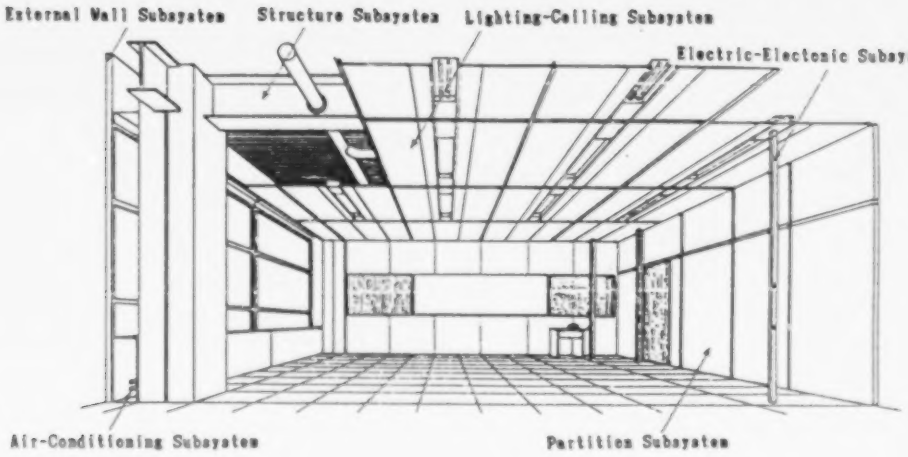
Hikarigaoka Primary & Secondary School Project (Tokyo)

III. Systems Building for School Architecture

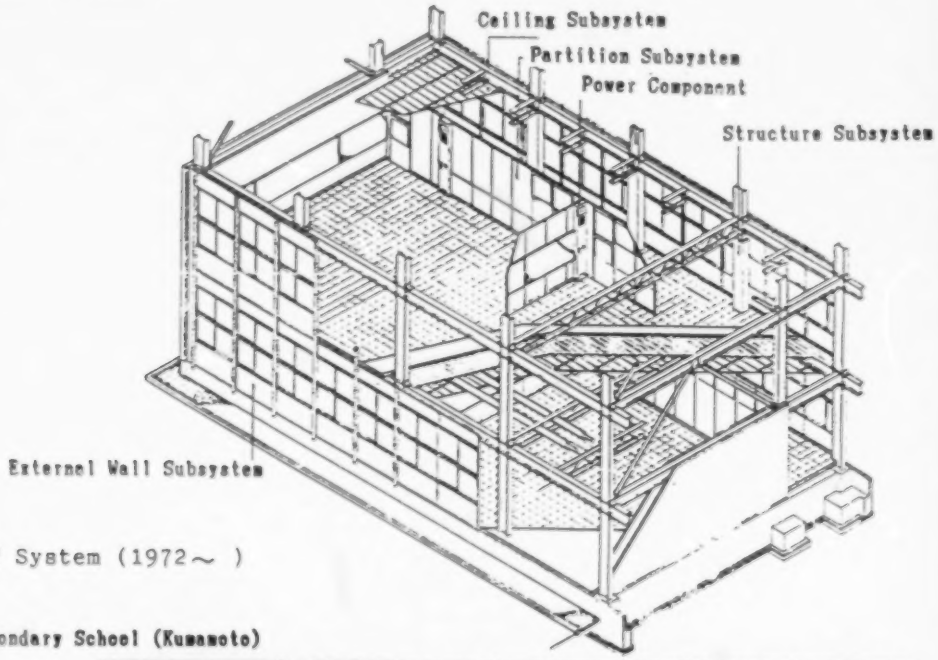
The application of prefabricated modules in school architecture is becoming an increasingly economic method of constructing school buildings. England, which has been a pioneer in this field since the mid-fifties, has produced a number of achievements which have attracted world attention. Although the construction plan for the Yagumo Elementary School, a project which we participated in back in 1955, leaned heavily in this direction, the use of prefabricated modules did not see significant developments in Japan for a number of years. Nevertheless, the use of prefabricated modules has since become an important theme in school architectural planning in Japan and it is a subject that we have seriously devoted ourselves to for some ten years.

The late fifties and early sixties saw the development in England of CLASP, a system which greatly facilitated the process of developing construction methods for school architecture. This work was continued in North America and gained considerable attention under the name, systems building for school architecture. The SCSD plan in California is an example of a plan which consolidates the demands of school architecture and the planning requirements for respective schools, brings them both together and then entrusts to private hands the development of construction methods based upon those demands and suitable for their respective planning requirements. SCSD has become an important reference source for school architectural planners.

In the late sixties, studies were carried out in Japan in cooperation with manufacturers for the purpose of developing sub-systems. This research, which we played a role in, did not, unfortunately, address the critical question of consolidating needs in advance, and thus did not progress to the extent of developing an epoch-making construction method like the GSK. Nevertheless, in the years since, there have been a number of examples of manufacturers developing building systems independently and of municipalities conducting studies of construction methods. So far, approximately 300 schools have been constructed in Japan using systems building.



GSK System (1975～)



SEFT System (1972～)

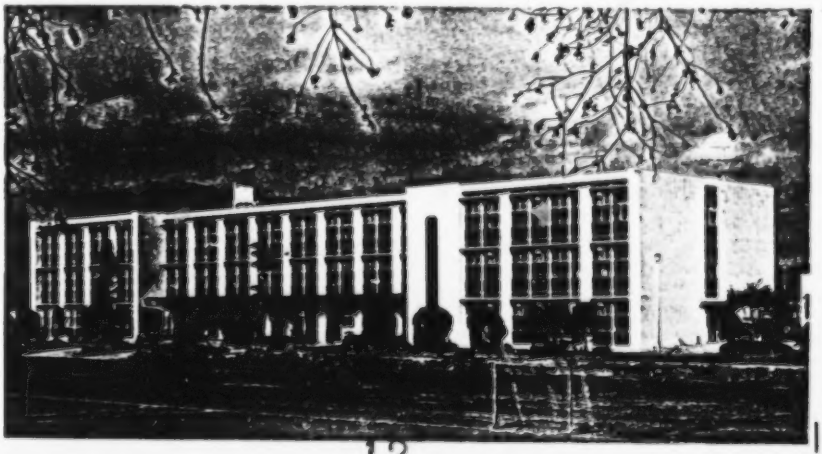
Yunomae Lower Secondary School (Kumamoto)

Design : M. Moronuki

Total Floor Area : 3680m²

No of Class : 10

Work Finished : 1981



IV. A School Architectural Plan Tailored for Individualized Guidance and Individuality in Learning

Promotion in Primary and Lower Secondary Schools
Proposal for and Promotion of "Open Schools"

Whatever one may say, the standardization of school buildings is largely a result of the uniformity of an educational system that is typified by a 50 minute instructional period in which all students are taught simultaneously in a classroom format and instruction is carried out at a uniform rate of progress. The standardization of the single-loaded corridor style school building since the late nineteenth century is responsible for the uniformity of schools. The necessity of a revolution in education which will give rise to a more flexible educational system and more diversified kinds of schools is an issue that is being taken up on a nationwide scale in Japan today. The impact of informal schools in England and of open schools in North America, proposals which were introduced in the mid-sixties for the purpose of breaking down conventional educational systems and uniformity of school facilities, promises to bring about fundamental reforms in the way we think about school architectural planning.

For us, the first goal of such a reform is to move from the idea of constructing a school in which education is regulated by fixed rules to one which provides the student with a system for learning. For this reason it will be necessary to introduce a system which can promote individualized guidance and individuality in learning. Having teachers and students at each school imagine and devise a diversified system will become a fundamental educational principle.

The second goal of such a reform will be to move from the construction of schools as sites for education to the construction of living spaces designed for the learner; in other words, it will call for the development of environments in which children can be happy and fully active. It will become important to regard the main function of a school as providing space for many human activities that have not been functions of schools in the past, such as self-study, eating, recreation, conversation and other social and leisure activities.

Functions designed for this kind of individualization and diversification will not just call for a loosening up of wall standardization in school architecture. On the contrary, standardized walls will have to be removed. It is essential that teacher and student activities interact in revolutionary ways. We are not advocating nor do we seek radical change. Rather, we believe that it is important to build spaces that can produce an atmosphere to elicite change on a daily basis. Activities which tear down walls have been an important topic in school architectural planning at our research laboratory since the seventies. Today a number of these activities are being put into actual practise.

FUKUMITU CYUBU Elementary School (Toyama)

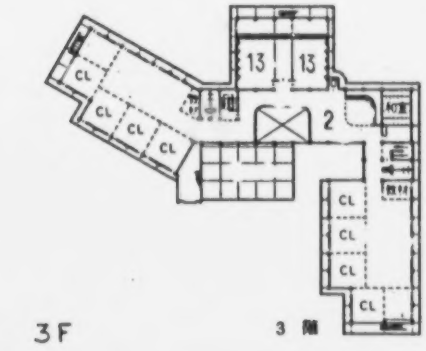
Design : Y. Nagakura & Development Group

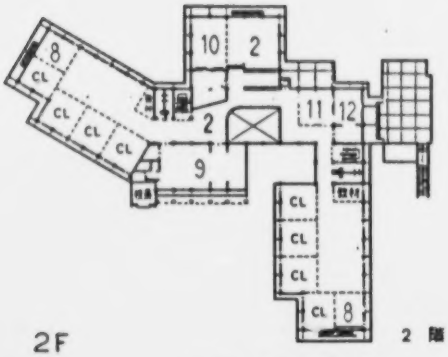
Site Area : 36350m²

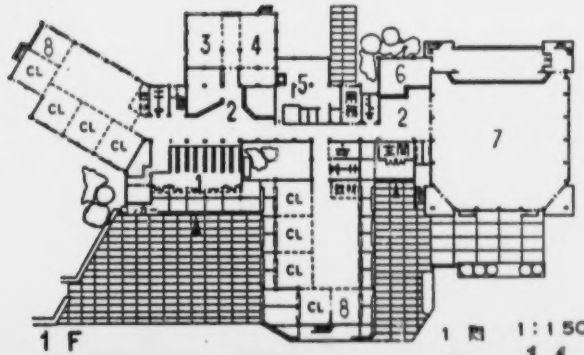
Total Floor Area : 8353m²

No of Class : 28

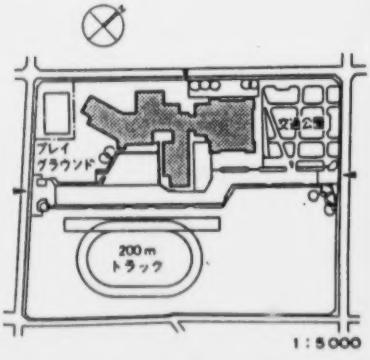
Work Finished : 1976







① entrance
② hall
③ craft
④ science
⑤ kitchen
⑥ lobby
⑦ gymnasium
⑧ store
⑨ staff
⑩ studio
⑪ special class
⑫ nurse
⑬ music
⑭ roof



1:1500 0 25 50m

MIYAMAE Elementary School (Tokyo)

Design : Y. Nagakura & Development Group

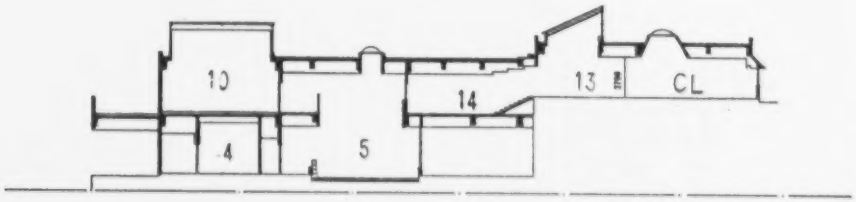
Site Area : 12577m²

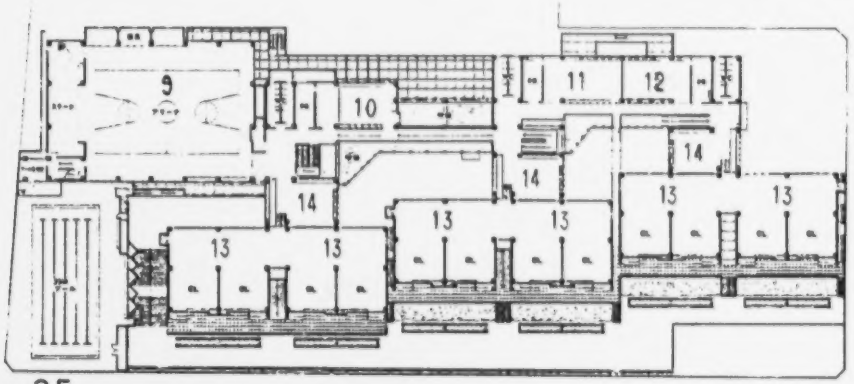
Total Floor Area : 5650m²

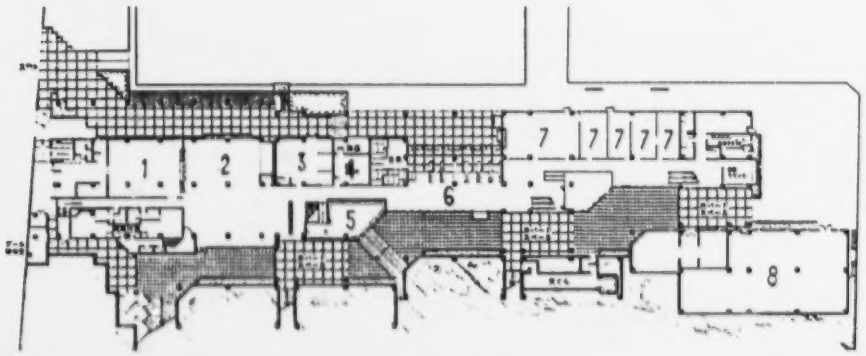
No of Class : 12

Work Finished : 1985

① kitchen
② home economics
③ nurse
④ studio
⑤ libraly
⑥ entrance
⑦ administration
⑧ store
⑨ gymnasium
⑩ music
⑪ craft
⑫ science
⑬ work space
⑭ medium space
⑮ void







Principles of Space Planning which Promote Individualization and Individuality

In line with the goals we have stated above, we feel that the following principles are important concepts in planning school architecture today. We actively utilize these principles ourselves. But they also provide guidance to school architectural designers throughout Japan.

(1) The keynote of promoting flexible learning activity is the planning of multi-purpose open spaces. Opening up the environment stimulates more open and flexible activities.
   (a) Design spaces that are much larger than conventional classrooms.
   (b) Also provide for classrooms that are much smaller than conventional classrooms.
   (c) Enable larger spaces to be broken down into smaller spaces using partitions or shelving.

(2) Think of the entire school environment as being a medium for learning.
   (a) The premise is that every space can be actively used as a place for learning.
   (b) Set up various kinds of spaces; for example, spaces where students can study in quiet, other spaces where they can study in private, as well as spaces where students can assemble easily in groups.

(3) In order to stimulate autonomous learning, try and make the students come to understand each other's behavior, to come in contact and to interact through their environment.
   (a) All of the different spaces within the school must provide a feeling of being contiguous.
   (b) Do not add doors except where they are essential. Activities within rooms should be visible and comprehensible from outside.
   (c) Extra space is essential. Learning space in general should have a minimum of 3-4m^2 or more per person.

(4) The utilization of multi-purpose spaces requires many different kinds of furniture and learning tools.

(a) It is not a good idea to have individual desks. It is necessary to have study carrels, trapezoidal, round and other kinds of tables for group study.
(b) Storage shelves, book shelves, drawers and so forth are essential. All should be moveable.
(c) Electrical power, water and drainage should be ample to fulfil the needs of multi-purpose spaces.

(5) Learning centers for making, organizing, and receiving individual learning materials will occupy central locations in the schools of the future.
(a) Make a structure which is easy to understand, provides easy access and occupies a central location from which all other parts of the school are within easy reach.
(b) Don't give elementary schools a centralized learning center. Instead, incorporate the function into the learning spaces.
(c) In lower secondary schools, separate learning centers for different subjects are a practical necessity.
(d) In kindergardens and primary schools, make separate alcoves and corners for each of the various school activities. Allocate teaching materials, teaching tools and school equipment according to the purpose of the activity.

GUSHIKAWA Elementary School (Okinawa)

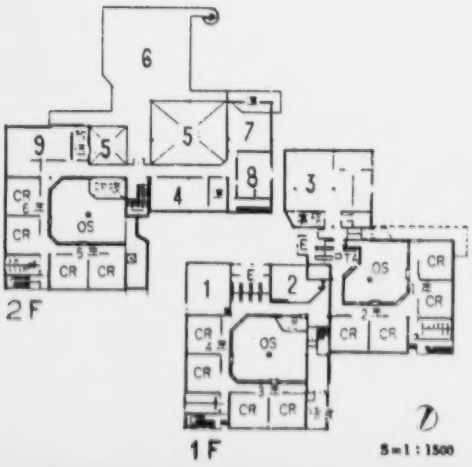
Design : Y. Nagakura & Development Group

Site Area : 16814m²

Total Floor Area : 3313m²

No of Class : 13

Work Finished : 1982



① machine ⑩ roof
⑫ library ⑰ music
⑬ administration ⑱ special class
⑭ craft ⑲ science
⑮ void

New School Organization Proposals for Secondary Schools and School Architectural Planning

U+V type special classrooms and V type subject classrooms are typical of the types of school organization found in secondary schools. The U+V type is used in the overwhelming majority of Japanese secondary schools, while in England and in North America, the V type predominates. But in consideration of the need to cope with the problems of promoting individualized and autonomous learning, it will be necessary in Japan as well to adjust our thinking to the increased possibilities presented by the V type school organization. When we consider the contemporary significance of the V type we find the following:

Schools at the secondary level or higher utilize a system in which teachers teach a single subject. When we introduce a flexible structure for group learning, one with diversified learning methods, or which utilizes team teaching, for example, each subject is taught separately. It is necessary then for classrooms in which the same subject is taught to be arranged in a block. Conventional school buildings with classrooms lined up linearly cannot accomodate this kind of arrangement.

In consideration of the fact that these kinds of structural reforms make the instruction of separate subjects more effective, it follows then that school buildings with a V type organization make it easier to accomodate different subjects. When teachers are permanently assigned to individual subject laboratories, it becomes easier to coordinate teaching materials and research.

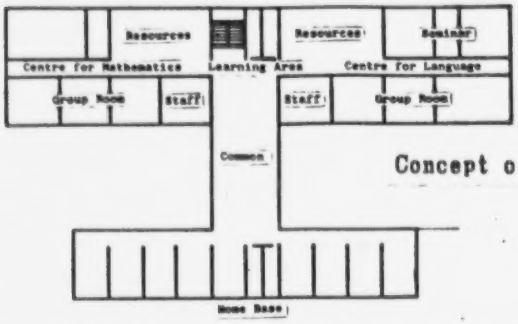
In school buildings with a V type organization, furniture and instructional media relevant to each subject can be arranged in separate media centers (open spaces) and environments can be set up to promote individual learning.

In regard to the above, school buildings with a V type organization have traditionally posed a number of problems which must be dealt with:

It is necessary that the plan have acomodations for setting up home rooms since there are no rooms provided for the student's own use.

It is necessary that student lockers be placed in suitable locations to ensure that movement between classes is smooth and uninhibited.

Because teachers are permanently located in teachers rooms or laboratories spread out throughout the school, it is essential to plan for a lobby or lounges where teachers can assemble naturally from time to time in order to communicate with one another and to provide management which will facilitate faculty communication and coordination.



Concept of New Secondary School

GUSHIKAWA HIGASHI Lower Secondary School (Okinawa)

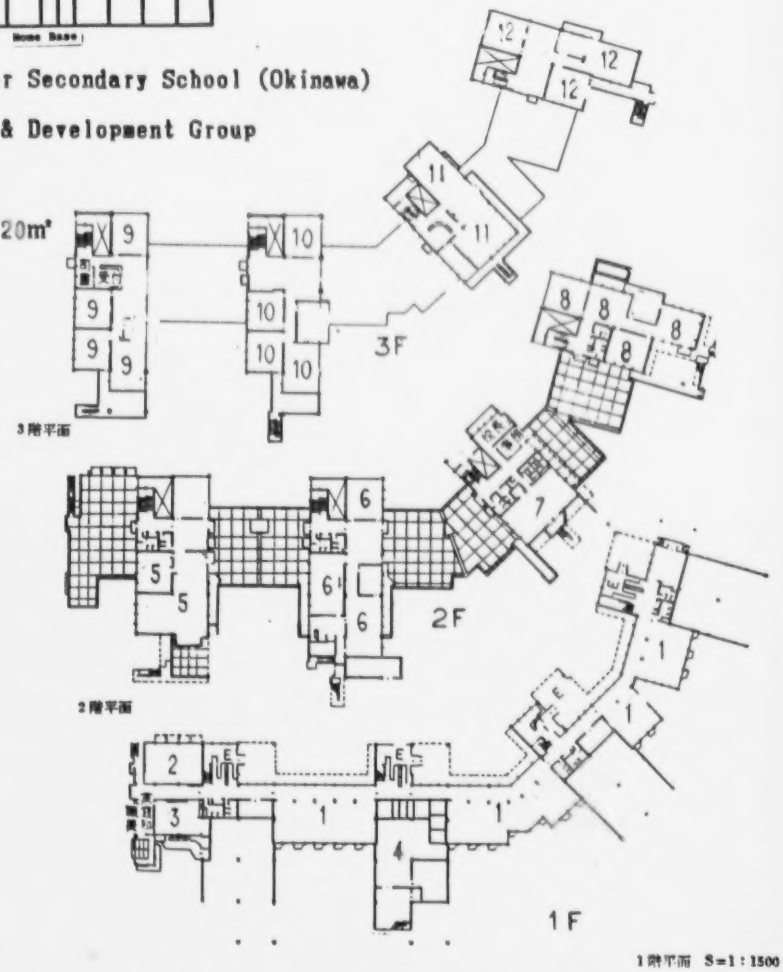
Design : Y. Nagakura & Development Group

Site Area : 30446m²

Total Floor Area : 8120m²

No of Class : 15

Work Finished : 1981



① home
② cooking
③ needle craft
④ machine
⑤ metal & wood work
⑥ science
⑦ office
⑧ language
⑨ humanities
⑩ mathematics
⑪ art & music
⑫ english

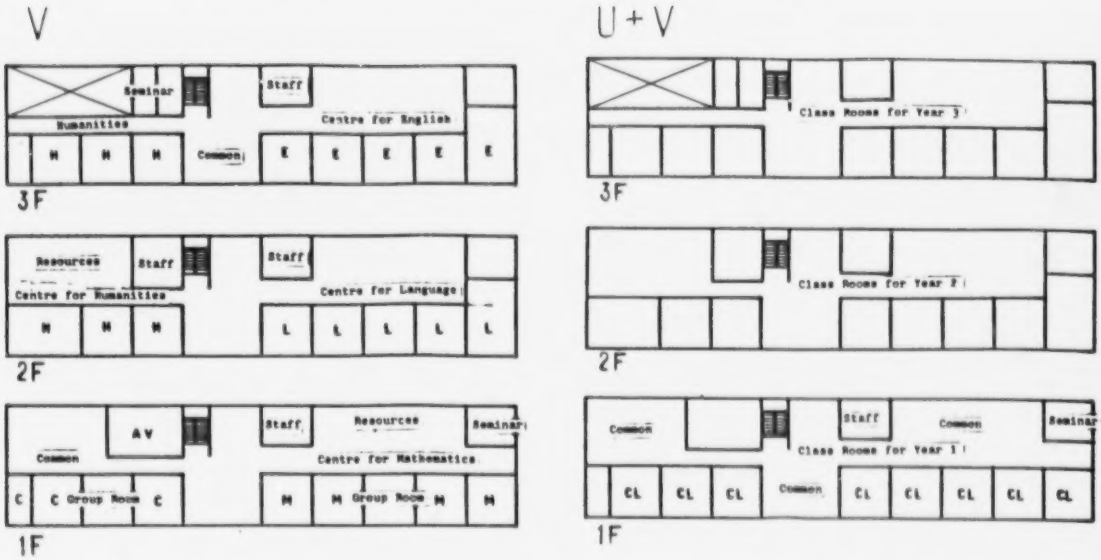
Architectural Planning which can Accomodate Both U+V Type and V Type Organizations

V type organization is an effective organizational method in regard to the question of promoting individualization and individuality in learning in schools at the secondary level or beyond, and school buildings designed along these lines make this possible. What is worth noting here is that although it is practically impossible to carry out V type organization in a school building designed for U+V type organization, it is possible to do the opposite. Although we realize the effectiveness of V type organization in coping with future improvements in learning methods, we often come across situations in which it is impossible to switch organizational methods right away. In such a case, it is necessary to seek a plan which not only makes it possible to carry out U+V organization but, whenever the time is ready, can smoothly effect a transition to V type organization. Points to be taken in consideration in this regard are as follows:

With U+V type organization, the most important thing is to have a plan which clearly arranges grade-level classrooms into groups on each floor and in each building block.

With V type organization, the most important thing is to clearly arrange classrooms in blocks around a subject media center.

The third point to consider in the case of V type organization, is to utilize a house system and be able to provide "non-classroom rooms" for forming groups. To enable both kinds of organization, while being strongly conscious of the subject block arrangement, it is important not to forget to arrange subject classrooms (for drawing, civics, math, English, etc.) in groups for each grade level. It is also important to make sure that they are arranged in groups on each floor and in every building block.



Concept of School which can accomodate both U+V & V

HIBIYA Upper Secondary School (Tokyo)

Design : Y. Nagakura & Development Group

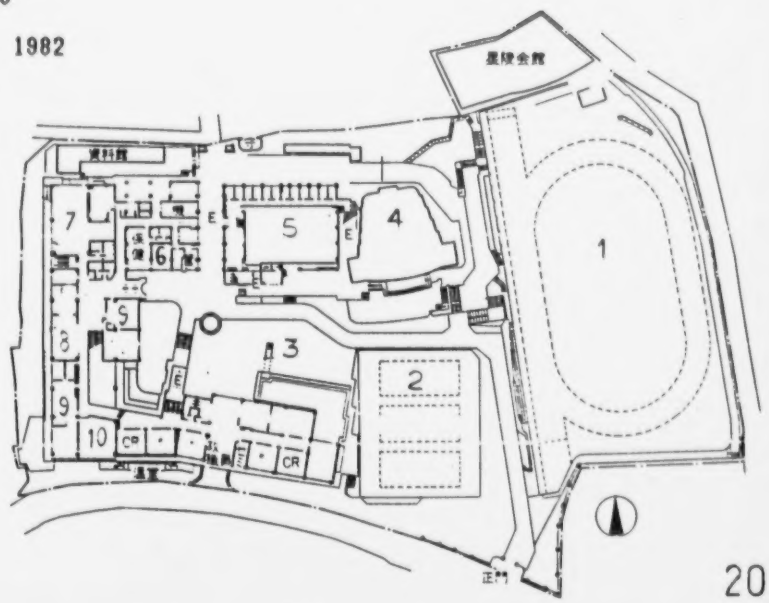
Site Area : 24581m²

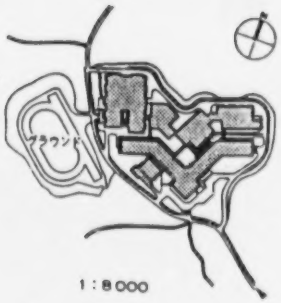
Total Floor Area : 14857 m²

No of Class : 18

Work Finished : 1982

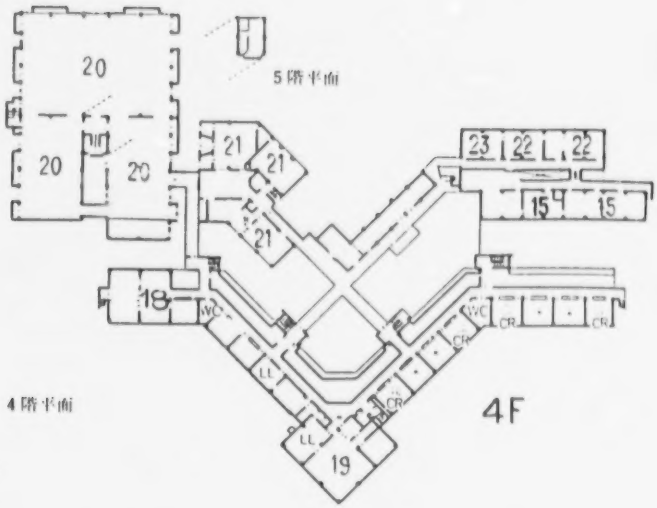
① field
② tennis court
③ court
④ auditorium
⑤ training
⑥ nurse
⑦ dining
⑧ staff
⑨ office
⑩ meeting

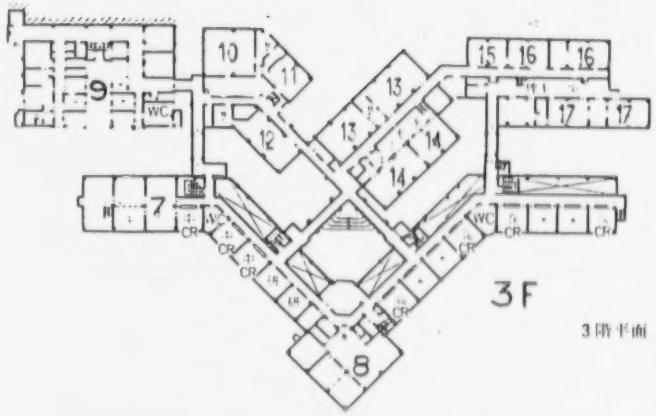


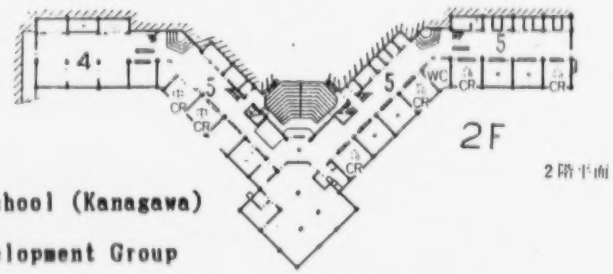


1:8000

① dining
② entrance
③ administration
④ society
⑤ mall
⑥ class room
⑦ language
⑧ administration
⑨ club room
⑩ art
⑪ shodo
⑫ craft
⑬ needle craft
⑭ cooking
⑮ science
⑯ chemistry
⑰ biology
⑱ mathematics
⑲ learning laboratory
⑳ gymnasium
㉑ music
㉒ phisics
㉓ physical geography







NIHON JYOSHIDAI Secondary School (Kanagawa)

Design : Y. Nagakura & Development Group

Site Area : 50300m²

Total Floor Area : 21882 m²

No of Class : 42

Work Finished : 1978

V. A Spatial Plan for a School as a Living Environment

Once we begin to think of schools as existing, not for the purpose of instruction, but, rather, as an environment where children and students spend their entire day, then we find that playing, resting, talking, eating, planning, doing research and all the other activities that children and students carry out in the course of their day, become functions that are embraced by the school. Although the school classroom is an extremely powerful unit, these kinds of functions must be performed in various kinds of groups that transcend both the class and the grade level, and involve multilateral social interactions between students, as well as teachers. With such a broad definition, this kind of educational activity cannot be limited to designated times or places. For this reason, it is necessary to design plenty of common space and lounge and lobby areas. Plans with pleasant and creative spaces stimulate social interaction and the range of daily activities. This is something that we have kept vividly in mind since the seventies and we have incorporated such spaces into every one of the 40 or so schools that we have designed since. It was difficult to provide the floor area for so much common space in the face of increasing budget restraints, but we were able to do so through proper planning.

KANEHARA Elementary School (Okinawa)

Design : Y. Nagakura & Development Group

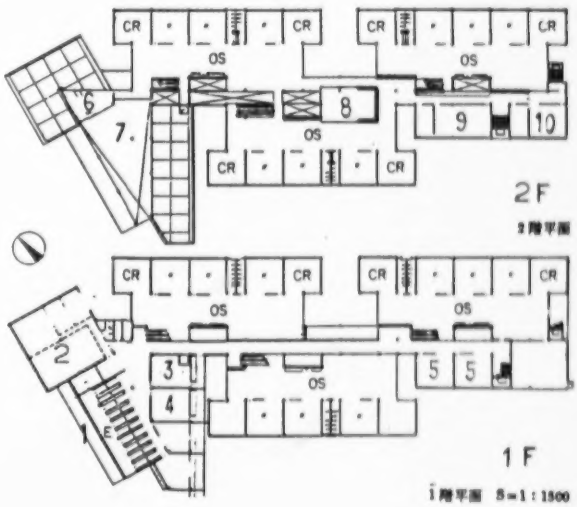
Site Area : 19087m²

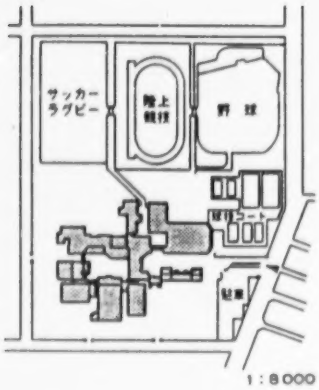
Total Floor Area : 6772m²

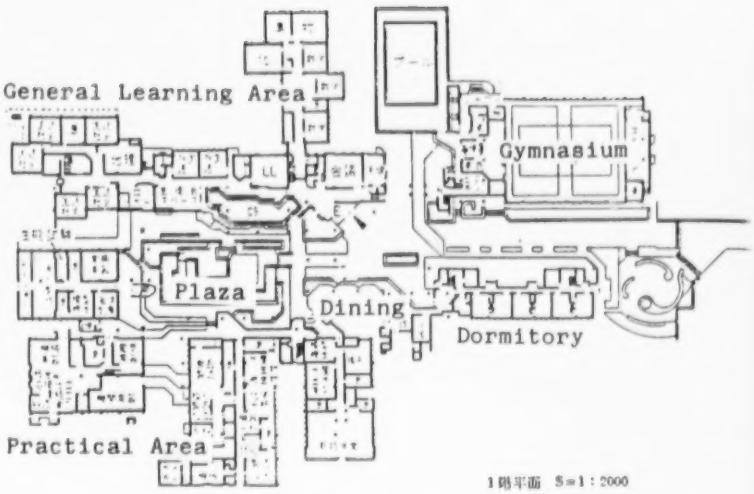
No of Class : 32

Work Finished : 1983

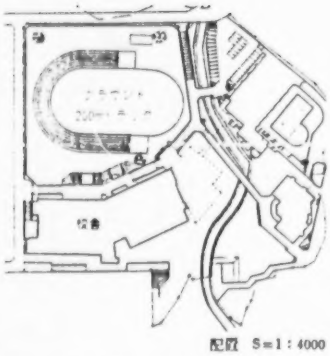
① entrance
② administration
③ machine
④ nurse
⑤ special class
⑥ studio
⑦ void
⑧ library
⑨ craft
⑩ music







Okinawa Fisheries High School (Okinawa)


配置 S=1:4000

AKAMICHI Elementary School (Okinawa)

Design : Y. Nagakura & Development Group

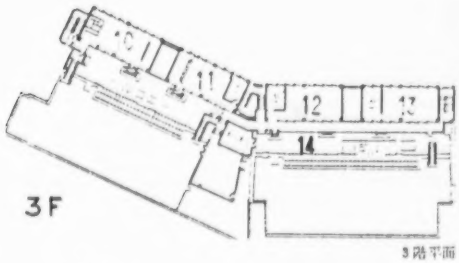
Site Area : 24780m²

Total Floor Area : 7660m²

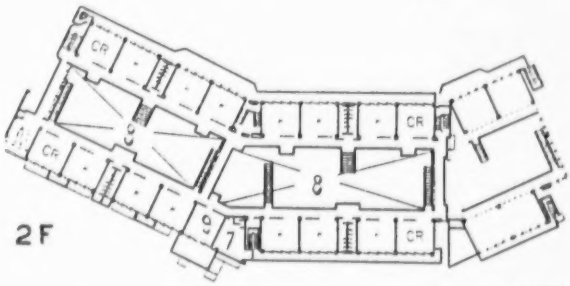
No of Class : 30

Work Finished : 1980

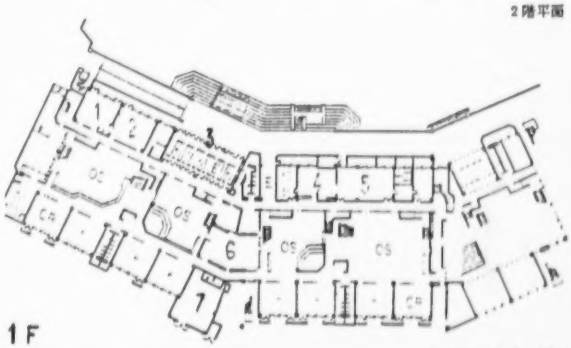
① special class
② nurse
③ entrance
④ office
⑤ staff
⑥ library
⑦ machine
⑧ void
⑨ meeting
⑩ home economics
⑪ music
⑫ craft
⑬ science
⑭ roof balcony



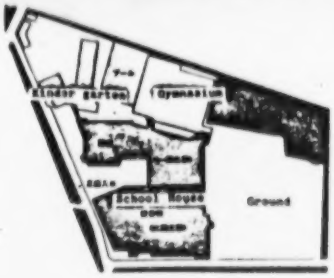
3階平面



2階平面



1階平面 S=1:1500



JYUNONJI Secondary School (Tokyo)

Design : Y. Nagakura & Development Group

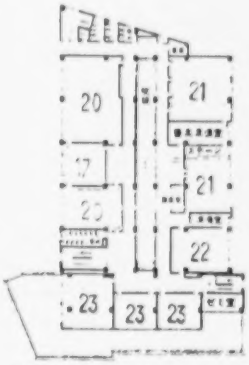
Site Area : 18370m²

Total Floor Area : 20000 m²

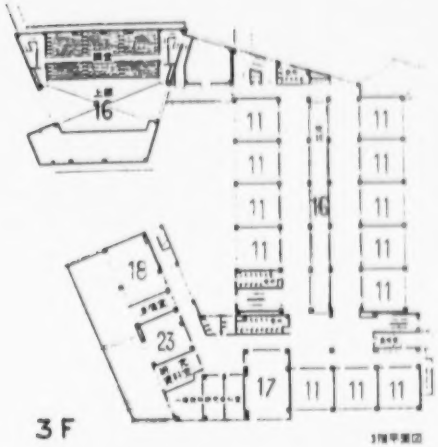
No of Class : 36

Work Finished : 1984

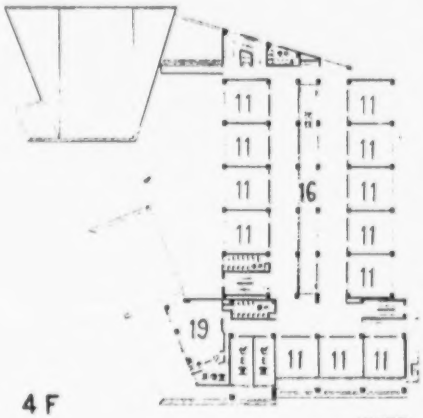
① entrance
② meeting
③ office
④ administration
⑤ common space
⑥ nurse
⑦ library
⑧ cooking
⑨ needle craft
⑩ auditorium
⑪ class room
⑫ chemistry
⑬ biology
⑭ physics
⑮ science
⑯ void
⑰ staff
⑱ L.L room
⑲ audio-visual
⑳ art
㉑ music
㉒ abode
㉓ seminar



5F

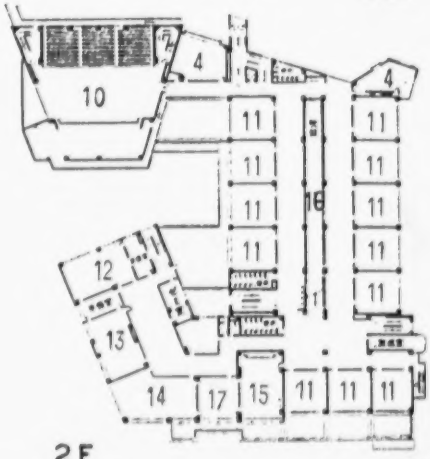


3F



4F

1F



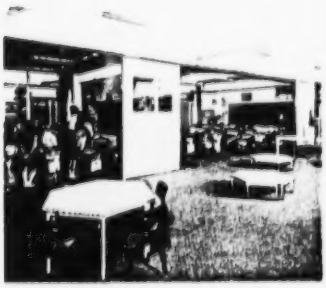
2F

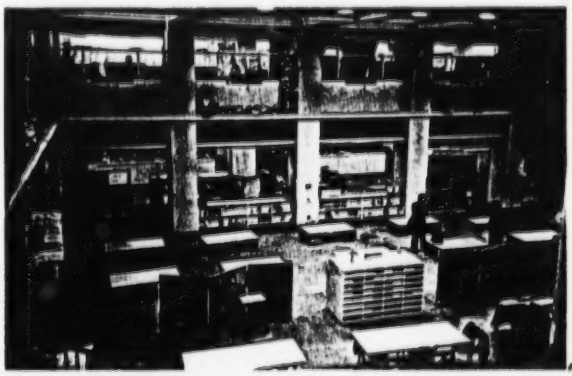
VI. Cost Study and Furniture Development for New School Architecture

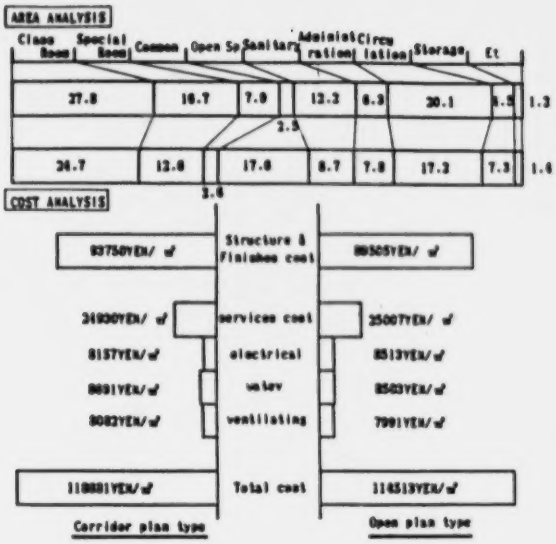
A Cost Study for an Open Plan School Building

In comparison to conventional type schools, the open plan school, because it is composed of a contiguous space that has carpeted floors and uses moveable partitions, conveys an image of luxury and thus gives an impression of higher construction costs. Actually, due to the fact that they have compact floor constructions and fewer internal walls, open schools have construction costs that are comparable to conventional type schools.

Gushikawa Elementary School, shown in the following floor plan, is a school that we designed in 1979. Originally the school was to have a single-loaded corridor arrangement and an operational plan for this was completed. But we suggested that the school be designed as an open plan school. Our ideas were taken into consideration and we were asked to come up with a quick design. We then conducted a cost comparison for an open school and a single-loaded corridor school under the same conditions. After preparing blueprints with equal floor area for both schools and completing a cumulative report, we tabulated the results of our analysis and found that the construction estimates for an open school were 4,000 yen cheaper per square meter. Due to savings from the use of a large pitched roof, the actual cost difference was even greater. Because of the enormous cost constraints in school architecture, data from cost studies is essential. Cost estimates and allocation methods also are important. For this reason, through sustained analysis of past cumulative data, we have extended our cost analysis studies to school buildings and gymnasiums.

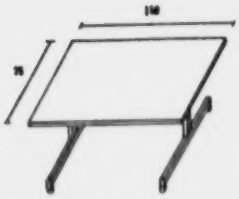




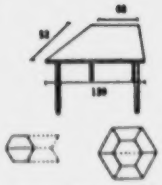


Furniture Development for Schools Designed for Diversified Learning Methods

Under the Japanese Industrial Standard, planning objectives for furniture used in schools in Japan ultimately call for the provision of desks and chairs that are suitable for children and students learning in a classroom situation. Furthermore, under the premise that activities performed during classroom time are carried out in unison, current oppinion is that although there are cases where specifications must vary, the configurations for desks and chairs should be uniform in all schools throughout the country. However, considering the great variety of learning and living activities that are called for in the diversification of education today, there is an obvious need to provide different kinds of furniture in necessary quantities. Providing furniture that can adapt to the functions of a variety of activities, suitably allocating different kinds of furniture according to location, and giving children and students, as well as their teachers, the option of selecting the kind of furniture that is most appropriate for the work that they are doing in whatever location, whether studying in private or as a group, are all becoming fundamental criteria. We have grappled with this issue as an important aspect of the revolution in education and we are now coming to grips with the development and introduction of such furniture.



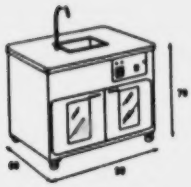
Square Table



Trapezoidal Table

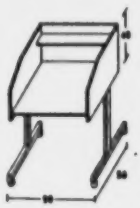
Round Table

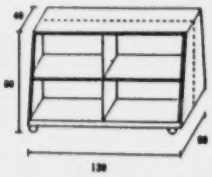
Oblong Table



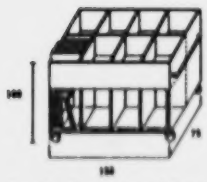
Mobile Sink

Mobile Craft Table

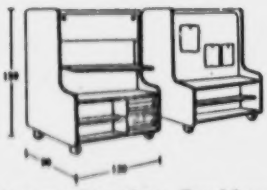




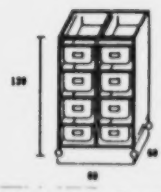
Mobile shelf



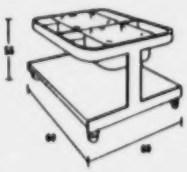
Book Box Trolley

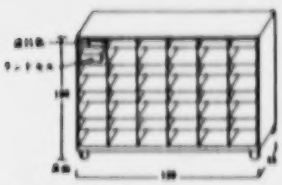


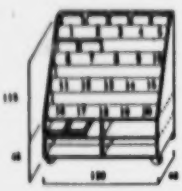
Upper Display Trolley

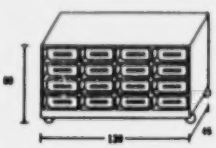


Material Trolley









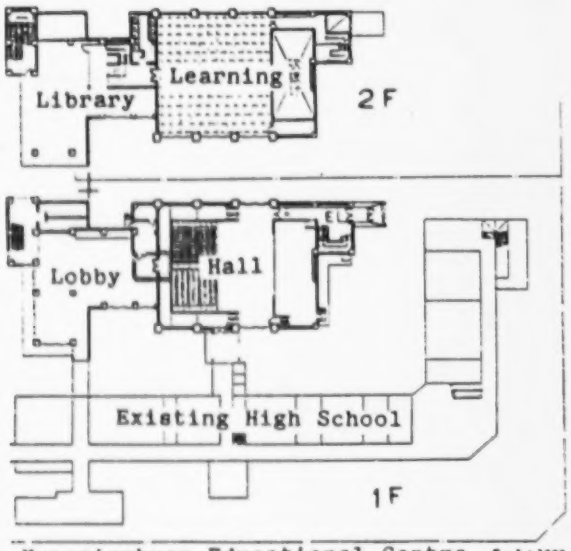
Mobile Locker

VII. School Architecture that is Open to the Community

There is a stronger conviction today that schools should be opened up in a positive way to the community by positioning them as central facilities of the community. Use of school facilities by the community is becoming more and more commonplace throughout the country. Tearing down classroom walls, in other words, the promotion of autonomous, individualized learning which is the objective of education reform, can build a school system seen from the eyes of the learner. This concept, which calls for a transformation from a system for teaching to one that is designed for learning, can be extended in a similar way to apply to the residents of the community which surrounds the school. Linked closely to the theme of life-long learning, it calls for the creation of schools which are truly open to the community. On the basis of a placement that is substantially different from the conventional idea of "opening school facilities", making schools that are true community centers and opening their functions in a positive way to the community will become a self-evident fact. At the outset, the ideal open school can either be a situation in which the facilities owned by the school are open to the community, or an approach that combines social educational facilities with public facilities. We have tried to demonstrate an example of the former in the plans for Kunori Campus Educational Center and of the latter in Takecho Elementary School in Taito Ward.

Takecho Elementary School, located in the center of a built-up, high density urban district, has school grounds that occupy an extremely limited area of only 4,396m^2. An example of a reconstructed, U-shaped reinforced concrete school building designed in 1925, the southern side of the school grounds lie adjacent to Takecho Park. Making use of the park extension, classrooms face south overlooking the park. Special attention has been paid to the ease with which the facilities can be used after school. As public facilities, a lecture hall and local office have been designed into the first floor and are connected to a vestibule hall so as to meld the structure into the row of buildings along the street.

Kunori Campus Educational Center, composed of Kunori Hall, a learning center and a library room, was designed with future educational reforms in mind for the purpose of providing open facilities for community members throughout their lifetime. Situated in a pre-existing building, it was designed and reconstructed for easy community use. A hall with seating for 400 was designed for use both as a lecture hall for school assemblies, and as a public hall for general functions. Rented out to various groups, the hall has an extremely high utilization frequency. The 305m^2 learning center on the upper floor is equipped with tall sliding walls that have excellent sound insulating functions and can be freely extended to form 1.4m^2 rooms, enabling the space to be divided into a series of rooms that can be used as interviewing rooms, lecture spaces or training rooms for word-processors, for example, or, as the need arises, into a completely open area for bridge parties or some other group community activity.



Kunorigakuen Educational Centre S=1:1000

TAKECHO Elementary School (Tokyo)

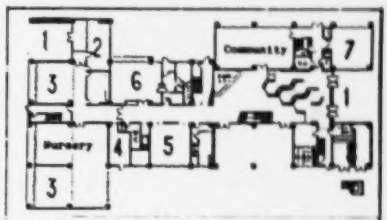
Design : Y. Nagakura & Development Group

Site Area : 4396 m²

Total Floor Area : 2882m²

No of Class : 12

Work Finished : 1983



Takecho Primary School (Tokyo)

① entrance
② staff
③ group room
④ wc
⑤ nurse
⑥ kitchen
⑦ meeting
⑧ store

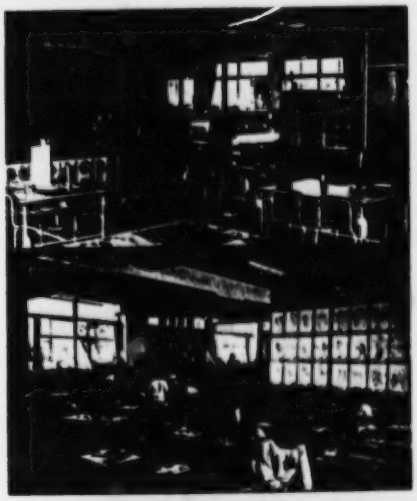
VIII. Reconstruction: Planning & Design Process

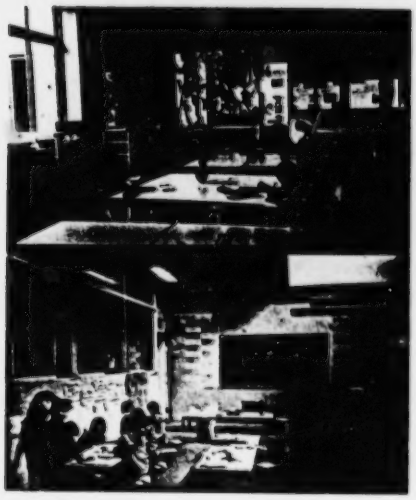
Ideal school architecture is not a question of uniformity. It is essential that the questions and issues that are grounded in the unique characteristics and traditions of each school be thoroughly examined when carrying out planning.

This does not mean design as a distribution of rooms, as is the premise of the single-loaded corridor type school building. Time must be taken to thoroughly consider all of the various demands and questions posed by a school; for example, what kind of organizational style is to be used, how meals will be arranged, and so forth. This involves holding consultations and conducting surveys. It is important that more people participate in this process; not just founders, users and students, but also parents, guardians and other individuals that share an interest in and concern for schools. In the course of this process, it is essential that through seminars, study visits to more advanced schools, and other activities, we create the circumstances that will promote understanding and consciousness among those concerned, and, at the same time, bring about the development of common planning goals.

This kind of process has been routine in every other kind of architectural planning situation for quite some time. Only school architecture (including that nearby public housing developments) lacks this process and continues on a widespread scale to carry out standardized design based on standardized functions. It goes without saying that if we are going to create good school architecture, we must have both the means and the time to do so. Furthermore, since each school presents unique characteristics and construction constraints, it can be expected that this process will stress different key points and involve varying lengths of time depending on the school. "Build schools with unique characteristics" is a catch phrase that we often hear these days. But we want to emphasize that it is not enough to have the attitude that one simply adds a few sculptures or wall reliefs. We must thoroughly consider the unique characteristics of each school. It is through adherence to a step-by-step process (general planning -> basic plan -> basic design -> operational design) that we build schools that are truly unique.

Our primary concern in the many architectural plans that we have participated in during the last ten years has been the confirmation of such a process. The realization of this process is something that we have repeated time and again. Without question this process demands a great deal of time and labor. But we have come to realize that this kind of process is the single greatest source of energy in the creation of innovative school architectural planning.





Basic Planning Process

The following table is a list of the major issues which we routinely address in the planning process. Kindergardens, primary and secondary schools each present their own unique problems and newly designed schools present problems which are different from those found in schools with conventional designs. Since surveys of the present situation were impossible previously, it has now become essential that surveys of similar schools be conducted.

Planning

Understanding and confirming planning constraints
- Building site
- Scope of the plan
- Cost estimates
- Building schedule

Understanding educational demands
- Educational objectives
- Curriculum
- Time schedules
- Organization
- Learning methods and instructional media

Understanding non-instructional demands
- Method of arranging meals
- Presence or absence of footwear change policy
- Kinds of personal property and storage areas
- Maintenance methods

Understanding community demands
- Opening schools
- Correlation with community facilities
- Population treads
- Natural conditions

Basic Plan
- Study of rooms and spaces needed
- Overall structure
- Distribution of floor area
- Block plan
- Legal check

Basic Design
- Floor plan
- Elevation, Sectional plan, (Overall design)
- Structural plan
- Facilities plan
- Construction method plan
- School furniture plan
- Coloring plan
- Outside drainage plan